

Incorporating ISO Standard 15099 into WINDOW5 and THERM5 and NFRC Ratings

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Acceptance of New Standards by ISO and ASHRAE

- Historically, WINDOW, THERM, FRAME, VISION, etc. calculations were based on “best science” as defined by developer
- ISO has finalized a standard (15099) on window heat transfer properties which define “best science” (as we know it today); ASHRAE expected to adopt this as well
- These committees represent almost all international scientists working in this field
- NFRC adopted ISO 15099 for “2001” standards
- LBNL has incorporated the ISO changes into WINDOW5 and THERM5

WINDOW 5: ISO 15099

Center-of-Glass

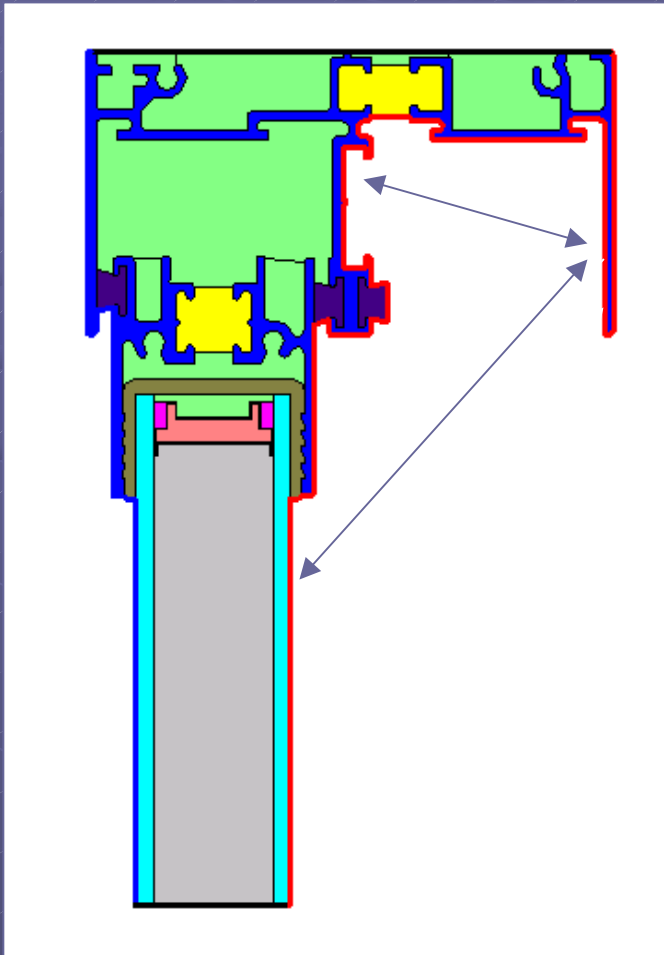
- Technical Improvements to WINDOW
 - gas properties and gas mixes
 - gap convective heat transfer algorithms
 - interior surface heat transfer coefficient (height dependent)
 - blackbody radiation model for exterior film coefficient
 - modified Solar Heat Gain calculations

THERM 5: ISO 15099

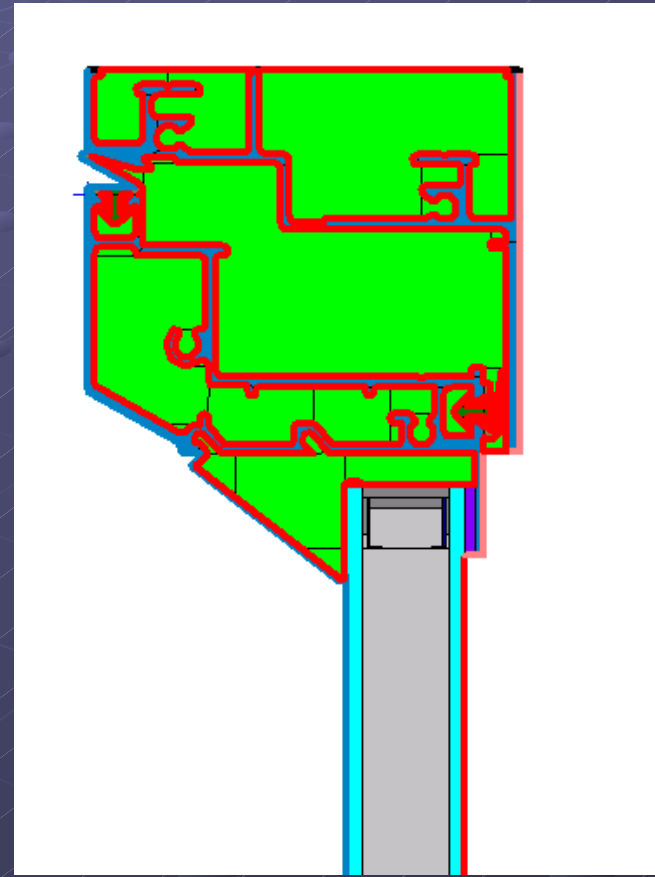
window frame and edge

- Technical Improvements to THERM
 - Detailed radiation model of frame interior surfaces
 - For condensation resistance and U-factor modeling
 - Changes Aluminum frame results
 - Use of actual frame cavity temperatures, emissivities, and heat flow direction
 - Frame cavity models are component dependent (jambs vs. sills)
 - Rectangularization of frame cavities improved
 - Cavity Gas Mixes (dividers in gas filled windows)
 - Slightly ventilated interior/exterior surface cavities
 - Improved modeling of frame solar heat gain
 - Change in convective heat transfer coefficients on frames

Effect of radiation model



Significant self-viewing



Not projecting window

Contact Info

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